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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,642	03/22/2001	Jeremy J. O'Hare	EMS-01501	4331

26339 7590 11/09/2004

PATENT GROUP
CHOATE, HALL & STEWART
EXCHANGE PLACE, 53 STATE STREET
BOSTON, MA 02109

EXAMINER	
GREY, CHRISTOPHER	

ART UNIT	PAPER NUMBER
2667	

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/814,642	O'HARE ET AL.	
	Examiner	Art Unit	
	Christopher P Grey	2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1. Claims 3, 57 and 68 contain the trademark/trade name Symmetrix. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a data storage device and, accordingly, the identification/description is indefinite.

Claims 3, 57 and 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. These claims are omnibus type claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 22-27, 49-56 and 58-65 rejected under 35 U.S.C. 102(b) as being anticipated by Bertin et al. (US 6400681)

Regarding claim 22, Bertin shows (see fig 2) a network consisting of a host computer (element 213) connected to a number of nodes (storage devices- elements 201-208) that forms a storage area network (element 200). The host and first storage device (node- element205) are connected through a LAN (element 214). Within the network a destination path is determined as disclosed in Col 6 lines 1-17. This determined path may consist of a number of intermediate nodes depending on the optimal path chosen (as disclosed in Col 8 lines 17-28). The origin node (first storage device), the transit node (intermediate node) and the destination node exchange information using the connection requests as disclosed in Col 11 lines 44-60.

Regarding claim 23, Bertin shows within the network (see Fig 2), a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208).

Regarding claim 24, Bertin discloses an optimal path selection (dynamic) as disclosed in Col 8 lines 17-44. Furthermore Bertin discloses a Bandwidth management procedure that allows an instructional format as disclosed in Col 11 lines 30-41.

Regarding claim 25, Bertin discloses the pre-calculation of the communication path in an instructional format, satisfying a connection request (disclosed in Col 5 line 60- Col 6 line 17).

Regarding claim 26, Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. Bertin discloses a Routing Database Update that prepares for alternative communication paths as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9).

Regarding claim 27, Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9).

Regarding claim 49, Bertin shows (see fig 2) a network consisting of a host computer (element 213) connected to a number of nodes (storage devices- elements 201-208), which forms a storage area network (element 200). The host and first storage device (node- element205) are connected through a LAN (element 214). Within the network a destination path is determined as disclosed in Col 6 lines 1-17. This determined path may consist of a number of intermediate nodes depending on the optimal path chosen (as disclosed in Col 8 lines 17-28). The origin node (first storage device), the transit node (intermediate node) and the destination node exchange information using the connection requests as disclosed in Col 11 lines 44-60. Furthermore, Bertin discloses a control field that includes encoded identification of a

protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host.

Regarding claim 50, Bertin shows within the network (see Fig 2), a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208).

Regarding claim 51, Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin also discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. Bertin discloses bandwidth management that allows a series of instructions related to the communication path to be carried out, as disclosed in Col 11 lines 34-43.

Regarding claim 52, Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. Furthermore Bertin discloses bandwidth management that allows a series of

instructions related to the communication path to be carried out, as disclosed in Col 11 lines 34-43.

Regarding claim 53, Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. Bertin discloses a Routing Database Update that prepares for alternative communication paths as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9).

Regarding claim 54, Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9).

Regarding claim 55, Bertin discloses a method for routing data packets in a communication network that comprises a plurality of nodes (storage entity). Referring to Fig 2, Bertin shows within the network, a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208). Furthermore, Bertin uses these connections to communicate data packets (see Col 5 lines 45-60).

Regarding claim 56, Bertin discloses a plurality of nodes (data storage device) that are used for storage as disclosed in Col 7 lines 24-44.

Regarding claim 58, Bertin's method specifies the routing of data packets as disclosed in Col 5 lines 45-59.

Regarding claim 59, Bertin shows within the network (see fig 2), a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208).

Regarding claim 60, Bertin shows (see fig 2) a plurality of nodes (storage devices- elements 201-208) connected to one another through element 209.

Regarding claim 61, Bertin shows in Fig 2 a plurality of nodes (storage devices- elements 201-208) that communicate with one another. Within the network a destination path is determined as disclosed in Col 6 lines 1-17. This determined path may consist of a number of intermediate nodes depending on the optimal path chosen (as disclosed in Col 8 lines 17-28). The origin node (first storage device), the transit node (intermediate node) and the destination node exchange information using the connection requests as disclosed in Col 11 lines 44-60.

Regarding claim 62, Bertin discloses a determined path that may consist of a number of intermediate nodes depending on the optimal path chosen (disclosed in Col 8 lines 17-28).

Regarding claim 63, Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44.

Regarding claim 64, Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17.

Regarding claim 65, Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1,2, 4-21 and 28-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al. (US 5949760) in view of Bertin et al. (US 6400681)

Claim 1 Stevens et al. ('Stevens' hereinafter) discloses a method for establishing communication between nodes (storage device) in a mulithop network. Stevens particularly establishes a multi-hop communication network between nodes (see fig 2 and Col 2 lines 28-43). Stevens does not disclose determining a communication path between a first data storage device and a target data storage device; determining a first communication connection between said first data storage device and a second data

storage device included in the communication path; and sending a data operation request to said second data storage device.

Bertin et al. (Bertin 'hereinafter') discloses a method establishing a communication network between a plurality of nodes interconnected with transmission links. Within each node (storage device) there is a storage of routing paths, which are constantly updated (see Col 7 line 40-44). Bertin also discloses for each connection request, selecting a pre-calculated path from source node to destination node (disclosed in Col 5 line 60- Col 6 lines17). Furthermore, Bertin discloses within a connection set up process, a connection request being specified (disclosed in Col 11 lines 44-49). Bertin follows up the disclosed connection request by adding links and nodes on a hop by hop basis (sending data request to a second storage device), as disclosed in Col 12 line 56 – Col 13 line 9.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the establishing of a communication path and the routing of data as disclosed by Stevens, with the method provided by Bertin, who acknowledges the nodes as described by Stevens, and further provides a method with a defined communication connection, and determines dynamically the optimal route. Bertin also provides the option of a predetermined path and an alternate communication path. Both Bertin and Stevens disclose setting up a communication network between a number of nodes based on a data table, Stevens simply establishes a multi hop network as disclosed in Stevens Col 1 lines 44-60. The motivation for the above mentioned modifications are to optimize and efficiently manage the connection and communication

of nodes within a dynamic communications network (Stevens Col 1 lines38-41 and Bertin Col 5 lines40-43). The modifications also allow the routing of a multihop communication, with the option of a suitable path under regular conditions and also in the event of any failure or malfunction.

Claim 2, 6 Stevens discloses all of the limitations of claim 2, but fails to disclose a communication connection being one of: a local area network, a storage area network, or a data storage connection.

Bertin discloses a typical model of communications system, containing a plurality of nodes (storage devices) connected as seen in elements 200-209 in Fig 2, which forms a network (SAN). Bertin also discloses the connection of a LAN as seen in element 214 in Fig 2. The motivation for these claims is the same as for claim 1.

Claim 4 Stevens discloses all of the limitations of claim 4, but fails to disclose predetermining a portion of a communication path from a first data storage device to a target data storage device.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. The motivation for this claim is the same as for claim 1.

Claim 5 Stevens discloses communication between nodes, which uses an optimization method for connectivity of these nodes. Stevens discloses a potential link assignment (see element 38 in fig 2) that assigns links between neighboring nodes, where intermediate nodes clearly exist.

Claim 7, 8, 9, 10, 11, 12, 15 Stevens discloses the method of accommodating dynamic communication between nodes of the network as disclosed in Col 2 lines 29-44. Stevens does not disclose determining a second intermediate data storage device from a plurality of data storage devices connected to the first data storage device.

Bertin also discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. Furthermore Bertin discloses a typical model of communications system, containing a plurality of nodes (storage devices) connected as seen in elements 200-209 in Fig 2, which forms a network (SAN). Bertin also discloses the connection of a LAN as seen in element 214 in Fig 2. The motivation for these claims is the same as for claim 1.

Claim 13 Stevens discloses all of the limitations of claim 5, but fails to disclose information about the communication path in an instruction format associated with the multipath multihop system call.

Bertin discloses an instructional format that identifies the best possible route as disclosed in Col 11 lines 34-43. Bertin also discloses a method of setting up a communication path and connection that takes the form of instructions as disclosed in Col 11 lines44-66.

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the establishing of a communication path and the routing of data disclosed by Stevens, with the instructional format of determining a

communication path as disclosed by Bertin, in order to further optimize and maximize communication path determination (see abstract of Stevens).

Claim 14 Stevens discloses all of the limitations of claim14, but fails to disclose information including data about a portion of the communication path that is predetermined.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. The motivation for this claim is the same as for claim 1.

Claim 16, 17 Stevens discloses all of the limitations of claims 16 and 17, but fails to disclose determining at least one additional communication path or using at least one additional path between the first data storage device and a target data storage device.

Bertin discloses in the case of a node failing, the origin node being able to establish alternative connections as disclosed in Col 5 lines 5-7. Furthermore, Bertin discloses a routing base table that contains a number of paths that may match the path from a particular origin node to a destination node, or from one node to another, as disclosed in (see fig 11) Col 17 lines 28-53. Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for these claims is the same as for claim 1.

Claim 18, 19, 20 Stevens discloses a method for assigning communication links in a dynamic communication network of nodes as disclosed in Col 3 lines 55-65

Stevens discloses all of the limitations of claims 18, 19 and 20 but fails to disclose sending said data operation request on said first communication path and said at least one additional communication path such that said data operation request is directed to said target data storage device on a plurality of communication paths. Stevens also fails to disclose dynamically determining additional communication paths using modifiable parameters.

Bertin discloses the option of a node supporting multiple connections set up requests simultaneously as disclosed in Col 4 lines 22-34. Bertin also dynamically assigns alternate paths as the topology database is constantly updated as disclosed in Col 9 line 32- Col 10 line 3. The path selection process uses an algorithm that uses as input parameters, the user requirements (modifiable) and the status of the network links and nodes as maintained by the topology database (modifiable) as disclosed in Col 12 lines 1-11. Furthermore Bertin discloses quality of service parameters that are defined as a set of measurable quantities as disclosed in Col 12 lines17-24. The motivation for these claims is the same as for claim 1.

Claim 21 Stevens discloses all of the limitations of claim 21 but fails to disclose a quantity corresponding to a number of additional communication paths that is determined in accordance with network traffic.

Bertin discloses the path selection process being determined based on current traffic conditions as disclosed in Col 5 lines 25-29. The motivation for this claim is the same as for claim 1.

Claim 28 Stevens discloses a method for establishing communication between nodes (storage devices) in a mulithop network. Stevens particularly establishes a multi-hop communication network between nodes (see fig 2 and Col 2 lines 28-43). Stevens does not disclose a computer system comprising a host initiating a data operation request; a communication connection between the host and each of the three or more data storage devices, each of communication connections including at least one of a storage area network and a local area network; wherein each of the three or more data storage devices includes machine executable code for:

receiving and interpreting said data operation request over the communication connection that is one of a local area network and a storage area network;

determining if the data operation request is a multipath multihop system call; and

forwarding, in response to determining that the data operation is a multipath multihop system call, a second portion of the data associated with said the data operation request to another of the three or more data storage devices.

Bertin discloses a method and system for determining a communication path among a plurality of nodes. Bertin discloses(see fig 2) a network comprising a host computer (Element 213) connected to several nodes (element 201-208) that are configured to form a SAN (element 200). The communication connection between the host and nodes is one of a SAN as previously mentioned and LAN (element 214). Furthermore, Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node. This encoded identification is a clear indication of the use of machine executable code in the nodes. After receiving the connection

request and establishing a connection (establishing a multipath multihop system call) there is no longer a need for the destination address within the packet header, so therefore an identifier is embedded within the packet (second portion), and the packet is sent to the next node (disclosed in Col 3 lines 15-54). The motivation for this claim is the same as for claim 1.

Claim 29 Stevens fails to disclose removing a first portion of data associated with the data operation request if the data operation request is a multipath multihop system call.

Bertin discloses after a connection has been established (establishing a multipath multihop call), no need for the destination address within the header. As is well known in the art, header information can be discontinued in the transmission of a packet. An identifier is used to further specify the connection (disclosed in Col 3 lines 16-54).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the method of routing a multihop multipath communication as disclosed by Stevens, with the method of routing data provided by Bertin, that discloses the obviousness of removing header information that has previously been used. The motivation for removing a portion of the data is to remove information that will no longer be used to complete the path.

Claim 30 Stevens fails to disclose a first data storage device connected to a second data storage device, where the second data storage device is connected to a third data storage device, and the first data storage device is connected to the host, and the data

operation request being forwarded to the first data storage device and being a multipath multihop system call directing the third data storage device to respond to said data operation request.

Bertin discloses (see fig 2) within a network, a host (element 213) connected to a first node (element 205) which is further connected to a second node (element 202 or 206), which is further connected to a third node (possibly element 202, 205, 201, 208 or 206), depending on the path selected. The third node is a possible destination node and would thus be responsive to the connection request (data operation request) as disclosed in Col 5 line60- Col 6 line17. The motivation for this claim is the same as for claim 1.

Claim 31 Stevens discloses a method that establishes simultaneous communications between nodes having neighboring nodes in a multihop network of nodes (Col 1 lines 44-60). Stevens discloses all of the limitations of claim 29 but fails to disclose a host comprising machine executable code that determines a first communication path including first, second and third data storage devices, determines a second communication path using one of a storage area network and a local area network between said host and said third data storage device, sends said data operation request to the third data storage device.

Bertin discloses (see fig 2) a network comprising a host computer (Element 213) connected to several nodes (element 201-208) that are configured to form a SAN (element 200). The communication connection between the host and nodes is one of a SAN as previously mentioned and LAN (element 214). Furthermore, Bertin discloses a

control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

Claim 32 Stevens fails to disclose first and second communication paths being alternate communication paths.

Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

Claim 33 Stevens discloses a method that establishes simultaneous communications between nodes having neighboring nodes in a multihop network of nodes. Stevens does not disclose first and second communication paths.

Bertin discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). Bertin thus discloses a first and second communication path. The motivation for this claim is the same as for claim 1.

Claim 34 Stevens discloses a system for establishing communication between nodes (storage device) in a mulithop network. Stevens particularly establishes a multi-hop communication network between nodes (see fig 2 and Col 2 lines 28-43). Stevens does not disclose a data storage device comprising: machine executable code for determining a communication path between the data storage device and a target data

storage device; machine executable code for determining a first communication connection between data storage device and a second data storage device included in said communication path; and machine executable code for sending said data operation request to a second data storage device.

Bertin discloses a method and system for determining a communication path between a plurality of nodes. Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses the calculation of a path from the origin node to all possible destination nodes in response to each connection request (disclosed in Col 5 line61- Col 6 line17). Fig 2 depicts a possible first (element 205) and second (element 202 or 206) storage device. The motivation for this claim is the same as for claim 1.

<u>Claim 35</u> Stevens discloses other limitations of claim 35 but fails to disclose the first communication connection being one of: a local area network, a storage area network, and a data storage connection.

Bertin discloses (see fig 2) a network consisting of a host computer (element 213) connected to a number of nodes (storage devices- elements 201-208) that form a storage area network (element 200). The host and first storage device (node-element205) are connected through the LAN (element 214). The motivation for this claim is the same as for claim 1.

Claim 36 Stevens discloses all of the limitations of claim 36 but fails to disclose machine executable code for predetermining a portion of the communication path from the data storage device to a target data storage device.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17.

Claim 37 Stevens discloses all of the limitations of claim 37 but fails to disclose determining a first intermediate data storage device from a plurality of data storage devices connected to said data storage device', and determining a first corresponding communication connection between said data storage device and said first intermediate data storage device.

Bertin shows (see fig 2) a network consisting of a host computer (element 213) connected to a number of nodes (storage devices- elements 201-208), which forms a storage area network (element 200). The host and first storage device (node-element205) are connected through a LAN (element 214). Within the network a destination path is determined as disclosed in Col 6 lines 1-17. This determined path may consist of a number of intermediate nodes depending on the optimal path chosen (as disclosed in Col 8 lines 17-28). The origin node (first storage device), the transit node (intermediate node) and the destination node exchange information using the connection requests as disclosed in Col 11 lines 44-60. The motivation for this claim is the same as for claim 1.

Claim 38 Stevens discloses all of the limitations of claim 38 but fails to disclose dynamically determining a portion of the communication path from the data storage device to the target data storage device.

Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. The motivation for this claim is the same as for claim 1

Claim 39 Stevens discloses all of the limitations of claim 38 but fails to disclose determining an intermediate data storage device from a plurality of data storage devices connected to the data storage device.

Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. The motivation for this claim is the same as for claim 1.

Claim 40 Stevens discloses all of the limitations of claim 40 but fails to disclose information about the communication path in an instruction format associated with the multipath multihop path.

Bertin discloses bandwidth management that allows a series of instructions related to the communication path to be carried out, as disclosed in Col 11 lines 34-43.

Claim 41 Stevens discloses all of the limitations of claim 41 but fails to disclose information including data about a portion of the communication path that is predetermined.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. The motivation for this claim is the same as for claim 1.

<u>Claim 42</u> Stevens discloses all of the limitations of claim 42 but fails to disclose information including data about a portion of the communication path that is dynamically determined.

Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. The motivation for this claim is the same as for claim 1.

<u>Claim 43</u> Stevens discloses all of the limitations of claim 43 but fails to disclose the communication path being a first communication path, and the data storage device further comprising machine executable code for determining at least one additional communication path.

Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

<u>Claim 44</u> Stevens discloses all of the limitations of claim 44 but fails to disclose machine executable code for determining the use of at least one additional

communication path, an alternate communication path upon the occurrence of a data transmission problem.

Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

Claim 45 Stevens discloses a method that establishes simultaneous communications between nodes having neighboring nodes in a multihop network of nodes (Col 1 lines 44-60). Stevens fails to disclose machine executable code.

Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. The motivation for this claim is the same as for claim 1.

Claim 46 Stevens discloses all of the limitations of claim 46 but fails to disclose machine executable code for dynamically determining a quantity corresponding to a number of additional communication paths used in directing the data operation request to the target data storage device.

Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded

identification is a clear indication of the use of machine executable code in the nodes and host. Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 29-44. Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

Claim 47 Stevens discloses all of the limitations of claim 47 but fails to disclose the quantity corresponding to the additional communication paths being a modifiable parameter.

Bertin discloses the path selection process uses an algorithm that uses as input parameters, the user requirements (modifiable) and the status of the network links and nodes as maintained by the topology database (modifiable) as disclosed in Col 12 lines 1-11. Furthermore Bertin discloses quality of service parameters that are defined as a set of measurable quantities as disclosed in Col 12 lines17-24. The motivation for this claim is the same as for claim 1.

Claim 48 Stevens discloses all of the limitations of claim 48 but fails to disclose a quantity corresponding to a number of additional communication paths used, being determined in accordance with network traffic.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. Bertin also discloses an alternative path computation procedure as disclosed in Col 19

line 51- Col 20 line 30 (see fig 9). Bertin discloses the path selection process being determined based on current traffic conditions as disclosed in Col 5 lines 25-29. The motivation for this claim is the same as for claim 1.

4. Claims 66, 67 and 69-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gopal et al. (US 4748658) in view of Bertin et al. (US 6400681)

Claim 66 Gopal et al. (Gopal 'hereinafter') discloses within a telecommunications network, a plurality of nodes (data storage entity) that are interconnected. In order to route a call (communication of system call), a processor selects the best route from a list of possible paths by executing a call algorithm (disclosed in Col 3 lines 25-47).

Bertin discloses the use of software to allow more sophisticated routing (disclosed in Col 1 lines 27- Col 2 line2). Gopal fails to disclose machine executable code for, determining a communication connection between the data storage device and a connecting data storage entity, and for sending the communication to the connecting data storage entity using the communication connection. Bertin discloses a control field that includes encoded identification of a protocol to be processed in the node (disclosed in Col 7 lines 55-64). This encoded identification is a clear indication of the use of machine executable code in the nodes and host. Referring to Fig 2, Bertin shows within the network, a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to understand that routing through nodes (storage devices) as a communication path is determined is operated by the use of software. Bertin's invention details the method of routing, while Gopal makes clear that software is the means by which routing is operated and formatted.

Claim 67 Gopal discloses all of the limitations of claim 67 but fails to disclose the data storage entity being a data storage device.

Bertin discloses a plurality of nodes (data storage device) that are used for storage as disclosed in Col 7 lines 24-44. The motivation for this claim is the same as for claim 66.

Claim 69 Gopal discloses a method to route a call (communication of system call), where a processor selects the best route from a list of possible paths by executing a call algorithm (disclosed in Col 3 lines 25-47).

Claim 70 Gopal discloses all of the limitations of claim 70 but fails to disclose the communication being one of: a LAN, SAN, a data storage connection.

Bertin shows within the network (see Fig 2), a device storage connection (element 209) between nodes, a LAN connection (element 214) and a SAN (220) comprised of a number of nodes (elements 201-208). The motivation for this claim is the same as for claim 66.

Claim 71 Gopal discloses all of the limitations of claim 71 but fails to disclose the connecting data storage entity being a data storage device.

Bertin discloses a plurality of connected nodes (data storage device) that are used for storage as disclosed in Col 7 lines 24-44. The motivation for this claim is the same as for claim 1.

Claim 72 Gopal discloses all of the limitations of claim 72 but fails to disclose determining a communication path between the data storage entity and an endpoint, where the endpoint is another data storage entity and the connected data storage entity is included in the communication path.

Bertin discloses within the network a destination path being determined as disclosed in Col 6 lines 1-17. This determined path may consist of a number of intermediate nodes depending on the optimal path chosen (as disclosed in Col 8 lines 17-28). The origin node (data storage entity), the transit node (intermediate node) and the destination node (endpoint) exchange information using the connection requests as disclosed in Col 11 lines 44-60. The motivation for this claim is the same as for claim 1.

Claim 73 Gopal discloses all of the limitations of claim 73 but fails to disclose at least one intermediate data storage device included in the communication path.

Bertin discloses within a node, a route controller that calculates the optimum path through the network, including the number of intermediate nodes as disclosed in Col 8 lines 17-28. The motivation for this claim is the same as for claim 1.

Claim 74 Gopal discloses all of the limitations of claim 74 but fails to disclose dynamically determining a portion of the communication path.

Bertin discloses dynamically determining a communication path and within a node, a route controller that calculates the optimum path through the network, including

the number of intermediate nodes as disclosed in Col 8 lines 29-44. The motivation for this claim is the same as for claim 1.

<u>Claim 75</u> Gopal discloses all of the limitations of claim 75 but fails to disclose predetermining a portion of the communication path.

Bertin discloses a pre-calculated path satisfying a connection request, and also calculating paths from the origin node (first storage device) to all possible destination nodes (target storage device), as disclosed in Col 5 line 60- Col 6 line 17. The motivation for this claim is the same as for claim 1.

<u>Claim 76</u> Gopal discloses all of the limitations of claim 76 but fails to disclose determining an alternate communication connection and transmitting the communication using the alternate communication connection upon the occurrence of a data transmission problem.

Bertin discloses alternative connections in the case of node or link failure (disclosed in Col 5 lines 5-7). Bertin also discloses an alternative path computation procedure as disclosed in Col 19 line 51- Col 20 line 30 (see fig 9). The motivation for this claim is the same as for claim 1.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey
Examiner
Art Unit 2667

10/27/04
AFSAR QURESHI
PRIMARY **PATENT EXAMINER**